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Water Conservation

December 1995 - TI#7495

Introduction

Water conservation can save money, is required by Federal law, and is an integral part of the Air Force pollution prevention program and policy. The two major Federal initiatives for water conservation are: the "Energy Policy Act of 1992" and Executive Order No. 12902, "Energy Efficiency and Water Conservation at Federal Facilities." The Energy Policy Act of 1992 is a wide-ranging effort to effect change in the use of energy and water in the United States. Executive Order No. 12902 focuses on providing a better institutional process for Federal agencies to achieve the mandates of the Energy Policy Act. This fact sheet focuses on water conservation policy requirements, water conservation efforts and water conservation funding options.

Terminology

Comprehensive Facility Audit is a detailed examination of a building or facility. The purpose of this detailed examination is to allow an agency to enter into water savings performance contracts or to invite inspections and bids by private upgrade specialists for direct agency funded water efficiency investments. These investments are funded by an agency through their own budgetary process and supplemented by energy savings performance contracting and utility rebates. Comprehensive facility audits should include climate and weather influences, appropriate water conservation and operating procedures, recommendations for the acquisition and installation of water conservation measures, and a strategy to implement these recommendations.

Demand Side Management refers to utility-sponsored programs increasing water conservation or managing the demand.

Gain Sharing refers to incentive systems allocating some portion of savings which results from gains in productivity to the workers who produce those gains.

Prioritization Survey is a rapid assessment used by an agency to identify those facilities with the highest priority projects based on the degree of cost effectiveness and to schedule comprehensive facility audits prior to project implementation. The prioritization survey should include the type, size, and water use levels of the major water using systems in place at the facility; and the need, if any, for acquisition and installation of cost-effective water conservation measures.

Shared Energy Performance Contracting refers to a contract where the contractor incurs the cost of implementing water conservation measures including: performing the audit; project design; equipment acquisition and installation; personnel training; and equipment operation and maintenance. In exchange, the contractor gains a share of any water conservation cost savings directly resulting from implementation of these measures during the

term of the contract.

Federal Policy

Subtitle F, Federal Agency Energy Management, of the Energy Policy Act of 1992, requires water conservation measures be installed in all Federal buildings owned by the United States. This requirement pertains to only those measures with a pay back period of 10 years or less and they must be accomplished no later than 1 January 2005. The Act also contains provisions for water conservation management plans, leasing and contracting requirements, life-cycle cost methodology, budgeting for water conservation measures, incentives for agencies, reporting requirements, new technology demonstrations and agency surveys for potential water conservation savings. Executive Order 12902 does not substantially alter these requirements, but does set timetables for required facility water conservation audits and the implementation of recommendations arising from the audits.

Executive Order 12902, 8 March 1994, requires each agency responsible for managing Federal facilities to conduct a prioritization survey. These prioritization surveys will be used to establish priorities for conducting comprehensive facility audits (CFAs). Each agency shall develop and begin implementing a 10-year plan to conduct or obtain comprehensive facility audits based on the prioritization survey. Only cost-effective water conservation projects recommended in the CFA will be implemented. A water conservation project is considered cost-effective if its payback period is less than 10 years. In addition, these reductions must not interfere with the mission of the agency by hindering effective operations. Federal agencies must accomplish all cost-effective water conservation projects by the year 2005. Federal agencies must prepare an annual report on progress in achieving water conservation to the Department of Energy (DoE) and the Office of Management and Budget (OMB).

Air Force Policy

A key goal of the Air Force's Pollution Prevention Program is to instill pollution prevention as a way of life. To achieve this end, the "Air Force Pollution Prevention Strategy," Secretary of the Air Force, 24 July 1995, was revised to reflect changes in environmental laws, Executive guidance, and new Department of Defense policies and goals. This strategy includes the following water conservation objectives:

- Implement a comprehensive program to accomplish cost effective conservation in all existing installations and energy systems;
- Develop and apply incentive programs such as gain sharing, shared energy performance contracting and utility demand side management programs;
- Design and construct new facilities to minimize the life-cycle cost of the facility by utilizing energy and efficiency techniques and renewable energy technologies; and
- Operate, maintain and upgrade existing facilities to conserve water when cost-effective to do so.

Further, Air Force Instruction 32-7080, "Pollution Prevention Program," requires installation personnel to support water conservation efforts as part of their pollution prevention program.

As of March 1995, and annually, thereafter, all bases must accomplish audits of 10% of their facilities. These annual audits must be submitted to MAJCOMs for inclusion in a consolidated report to Headquarters Air Force Civil Engineer Support Agency (HQ AFCESA/CESC) who consolidates all Air Force reports and submits them to the DoE and the OMB.

Lead Agency and Incentives

The DoE Federal Energy Management Program is the Federal lead agency for implementing required water conservation measures. DoE is responsible for providing guidance, information and technical assistance to agencies seeking to implement water conservation measures. DoE, in coordination with the U.S. Environmental Protection Agency (EPA), General Services Administration (GSA) and DoD, will develop technical assistance services including help lines, computer bulletin boards, information and educational materials, and project tracking methods.

To encourage Federal agency water conservation, a number of incentives have been put in place. Federal agencies will be allowed to retain the water conservation cost savings they achieve to the extent permitted by law. In addition, agencies are to provide incentive awards to employees for exceptional performance in achieving water conservation and shall include such successes in performance evaluations where appropriate. Federal contractors and subcontractors in Federal buildings will be encouraged to adopt water conservation measures as well.

Further, the General Services Administration (GSA) was required to:

- Contact each utility that has an area-wide contract with GSA and determine which of those utilities will perform no-cost audits for water conservation;
- Determine which water utilities serving the Federal Government offer demand-side management services and incentives; and
- Prepare a list of these utilities, describe the services and incentives offered, and make the list available to all Federal property management agencies.

Air Force Implementation

The objective of Air Force water management is to reduce water use without degrading military readiness, safety, mission effectiveness, or quality of life. Installation water management programs should address the following areas:

- Developing water contingency plans for mission support
- Developing water conservation investment improvement projects
- Monitoring water usage and related costs
- Establishing aggressive water conservation efforts
- Fostering awards and recognition programs

The program focuses its efforts on the following main areas:

- Performing prioritization surveys
- Performing comprehensive facility audits according to initial prioritization survey results
- Promoting effective project management

The main purpose of a comprehensive facility audit is to detect inefficient water systems, determine how much water and money is lost through leakage or waste, and determine a feasible method to implement conservation recommendations. Bases are encouraged to seek out suppliers providing free audits. Air Force Facility Managers may acquire a list of all utilities offering no-cost water conservation audits and demand-side management services and incentives from GSA, (202) 501-1763.

The Air Force has been implementing many of these programs and requirements through the Energy Conservation Investment Program (ECIP). ECIP funding is "fenced " (dedicated) for energy and water conservation projects and is expected to increase substantially over the next three years. The Air Force is using ECIP funding to conduct water audits to identify water conservation projects and to implement cost-effective projects. The audits include: leak detection survey (if not accomplished in the previous five years); type, size, water use, and performance of all water-related systems; a summary of water conservation procedures; recommendations for acquisition and installation of water conservation measures; and implementation strategy.

Water Conservation Efforts

There are two basic types of water conservation methods: revising water use habits; and installation of water-saving and recycling equipment. Changing daily water use habits, like taking showers instead of baths, filling the sink with water when shaving or brushing teeth instead of letting the water run, and only running the washer when full, can save water. Recycling industrial water through closed loop wash rack systems and low volume/high pressure stripping systems offers installations a way to capitalize on the benefits of water conservation. Installing faucet aerators and water-efficient toilets and showerheads can save significant amounts of water. Water conservation projects with most economical payback include:

Plumbing Retrofit: Replacing older water-wasting fixtures with more modern water-efficient fixtures. One flush of a conventional toilet consumes about 3.5 gallons and 5-7 gallons for older toilets found in 80% of all homes. According to Mr. Mike Miller (HQ USAF/CEO), water conserving toilets are now available which consume as little as 1.6 gallons per flush. One 5 minute shower (with older showerhead) uses as much as 25 - 35 gallons. Using water-efficient plumbing fixtures (showerhead, faucet aerators, automatic shutoffs for hoses, and low flow toilets) will reduce the amount of water used.

Leak Detection and Repair: A leak detection and repair program is vital to water conservation. A leak detection and repair program in Arlington, MA, (with a population of 50,000) reduced water usage from 131 gallons to 100 gallons per person/per day. The East Bay Municipal Utility District of Oakland, CA recovered 4 million gallons per day in the first two years of its leak detection program.

Xeriscaping: Xeriscaping is the use of water-conserving landscaping which includes the use of drought-resistant plants, water restrictions and reduced lawn size. The use of landscape demonstration gardens that use low water-using plants can be a significant communication tool in water conservation. These gardens may be planted in locations used for various military ceremonies such as change of command, promotions, or other awards. The gardens demonstrate a variety of attractive, native low water-using plants, irrigations methods, permeable walkways, and other water-saving techniques.

Water Conservation Education: Education designed to raise awareness through public campaigns and offering tips for saving water should reduce residential water use. This may be accomplished by posting notices regarding proper use of water equipment or advising visitors of water conservation efforts. An installation water-conservation hotline for information and leak reporting is also an option.

USAF Successes

McClellan AFB eliminated the need to transport up to 500,000 gallons per day of hazardous waste-containing wastewater. This was accomplished through wastewater reduction efforts in cleaning, plating, and painting operations by heavy metal precipitation, sludge dewatering, wastewater recycling, and converting paint booths from water fall to dry filters. Lackland and Kelly AFBs are recycling industrial water flow and considering future recycling of water from cooling towers. Additionally, Andersen, Cannon, Dobbins, Eglin, F.E. Warren, Hickam, Homestead, Lackland, Los Angeles, MacDill, Mountain Home, Nellis, Otis, and Travis AFBs have purchased closed-loop wastewater recycling systems to minimize water consumption and hazardous waste disposal.

Pollution Prevention Benefits

Using less water has several pollution prevention benefits. Reducing the amount of water consumed reduces the amount of water treated. Also, lower amounts of hazardous chemicals and energy are required for water treatment. Reductions in irrigation and washing operation water runoff minimize the potential for the capture and transport of pesticides, fertilizers, detergents, and petroleum products. These reductions lessen the potential for contamination of water sources and treatment requirements. Recycling of industrial process waters through closed-loop systems allows reuse of the water and concentration of hazardous or undesirable constituents. Recycling conserves water and may reduce the amount of hazardous waste generated.

Summary

Water conservation methods are being researched and implemented as a result of the Energy Policy Act and Executive Order 12902. The Air Force is conducting water audits to identify cost-effective water-conserving options. Water conservation activities being implemented at installations include plumbing retrofit, leak detection and repair, xeriscaping, industrial water recycling and education. By implementing these activities, the Air Force is saving water as well as money.

PRO-ACT Can Help!

To obtain more information on water conservation, or to utilize PRO-ACT researchers to implement your initiatives, call DSN 240-4214.

References

1. Air Force Instruction 32-7080, "Pollution Prevention Policy," 12 May 1994.
2. U.S. Environmental Protection Agency, "A Citizen's Guide to Community Water Conservation," 1989.
3. Executive Order 12902, "Energy Efficiency and Water Conservation at Federal Agencies," March 8, 1994.
4. California Department of Water Resources, "Designing a Public Information Program for Water Conservation," October 1984.
5. Secretary of the Air Force, "Air Force Pollution Prevention Strategy," July 24, 1995.
6. Draft Air Force Energy Program Procedural Memorandum 95-XX, "Air Force Water Management Program," July 1995.

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